

USSN 10/721,484
Filed November 25, 2003

Remarks

This Response is submitted in response to the outstanding Office Action wherein the Examiner rejected claims 1-16.

Prior to discussing the present grounds of rejection, Applicants take this opportunity to set forth the following brief remarks about their invention. Applicants have discovered that irradiation of a fully polymerized coating atop an aluminum sheet to scission polymer bonds results in embrittlement to the polymer coating, which surprisingly eliminates the incidence of angel hair and feathering in the opening of scored beverage can lids. Prior to Applicants' discovery, it was believed that irradiation of a fully cross-linked polymer coating to cause chain scission was disadvantageous, since breaking polymer bonds typically results in loss of strength, adhesion failure, and/or yellowing of the polymer coating. Accordingly, it is respectfully submitted that the method as claimed, clearly describes the benefits obtained by the present invention, which are not shown or suggested in the prior art. Thus, Applicants respectfully submit that the application is in condition for immediate allowance.

Applicants have added new Claim 19 to recite a process for making a metal-polymer composite suitable for shaping into food and beverage container end panels and container bodies comprising scissioning polymer chains in the polymer by irradiating the coating with an electron beam, wherein irradiating is carried out for a sufficient time to embrittle the polymer in the coating, thereby to improve resistance of

USSN 10/721,484
Filed November 25, 2003

said coating to feathering and angel hair formation. Support for newly added Claim 19 is found in original Claims 1 and 10.

Turning to the Office Action, the Examiner rejected Claims 1, 2, 4-6 and 8-15 under 35 U.S.C. §103(a), as allegedly being unpatentable over U.S. Patent No. 4,452,374 to Hitchcock et al. ("Hitchcock et al.") in view of U.S. Patent No. 4,044,187 to Kremkau ("Kremkau"). Claims 1, 4-10, and 16, stand rejected under 35 U.S.C. §103(a), as allegedly being unpatentable over U.S. Patent No. 4,308,084 to Ohtusuki et al. ("Ohtusuki et al.") in view of Kremkau. Claims 1-10, and 16, stand rejected under 35 U.S.C. §103(a), as allegedly being unpatentable over U.S. Patent No. 5,582,319 to Heyes et al. ("Heyes et al.") in view of Kremkau. Applicants respectfully traverse for the following reasons.

To establish a prima facie case of obviousness three criteria must be met. First there must be some suggestion or motivation, either in the references themselves or the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Roussel*, 149 F.3d 1350, 1357, 47 USPQ2d 1543, 1457-58 (Fed. Cir. 1998). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally, the prior art reference (or references) combined must teach or suggest all of the claimed limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Referring to the §103 rejections of Claims 1, 2, 4-6 and 8-15, Applicants submit that the applied references fail to render Applicants' claimed invention unpatentable,

USSN 10/721,484
Filed November 25, 2003

since none of the applied prior art, either alone or in combination, teach or suggest a process for making a metal-polymer composite suitable for shaping into food and beverage containers and panels and container bodies, comprising the step of scissioning polymer chains in a polymer by irradiating a coating with an electron beam, thereby to improve resistance of the coating to feathering and angel hair formation, as recited in Claims 1, 16, and 19. "To establish a prima facie case of obviousness of a claimed invention all the claimed limitations must be taught or suggested by the prior art". *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 44, 496 (CCPA 1970).

Referring to Pages 2 of the present Office Action, the Examiner admits that "Hitchcock et al. does not teach scissioning polymer chains by irradiating the coating with an electron beam to improve resistance to feathering and angle hair". Therefore, since Hitchcock et al. do not teach or suggest scissioning polymer chains by irradiating the coating with an electron beam to improve resistance to feathering and angle hair, the reference fails to teach or suggest each and every limitation of Applicant's method, as recited in Claims 1, 16 and 19.

Still referring to Pages 2 and 3 of the present Office Action, to meet the limitation of scissioning polymer chains, the Examiner relies on the disclosure of Kremkau for allegedly teaching that increased bond strength, seal strength and dimensional stability of films laminates by irradiating a the polyolefin film using an electron beam. The Examiner further alleges that Column 1, lines 6-9, of the Kremkau disclosure, teaches a method that includes the steps of irradiating a polyolefin film with

USSN 10/721,484
Filed November 25, 2003

about 2-20 megarads to form a laminate, and the irradiating the entire laminate using an additional dosage between 2 and 20 megarads. The Examiner further alleges that irradiating the crosslinked layer with a second radiation of 2-20 megarads will inherently result in scissioning of polymer chains, since it is stated in Applicants' disclosure that applying additional radiation of 2-20 megarads to an already crosslinked polymer will result in chain scissioning. Applicants respectfully disagree and submit the following.

The Federal Circuit has held that inherency cannot be based on mere speculation. *See e.g., Continental Can Co. USA, Inc. v. Monsanto Co.*, 848 F.2d 1264, 1269, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991) (inherency "may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.") When anticipation is based on inherency of limitations not expressly disclosed in the assertedly anticipating reference, it must be shown that the undisclosed information was necessarily present in the subject matter of the reference. *See Elan Pharmaceuticals, Inc., v. Mayo Foundation for Medical Education and Research*, 304 F.3d 1221, 1228, 64 USPQ2d 1292 (Fed. Cir. 2002) (*citing Continental Can*, 948 F.2d at 1269). "The mere fact that a certain thing may result from a given set of circumstances is not sufficient [to establish inherency.]' ... 'That which may be inherent is not necessarily present. Obviousness cannot be predicated on what is unknown.' *In re Rijckaet* 9 F.3d 1534, 28 USPQ2d at 1957.

Applicants submit that the Kremkau reference does not render Applicants' invention unpatentable, since Kremkau fails to teach or suggest scissioning polymer

USSN 10/721,484
Filed November 25, 2003

chains by irradiating the coating with an electron beam to improve resistance to feathering and angle hair, as recited in Claims 1, 16 and 19. Applicants have discovered that the incidence of feathering and angle hair is substantially eliminated by reducing the chain lengths of the polymers coated onto the aluminum surface. Applicants irradiate at a high enough energy and exposure time to reduce the polymer chain length by chain scissioning. This effect is dependent on not only electron beam irradiation, but also polymer coating composition, exposure time and coating thickness. As recited in Claims 9 and 10, Applicants recite that irradiating comprises irradiating at a dosage of about 2-20 Megarads, wherein the step of irradiating is carried out for a sufficient time to embrittle the polymer in the coating.

Kremkau discloses that it is advantageous to have a laminate including at least two cross-linkable polymer layers, in which one of the layers has a higher degree of crosslinking than the other. Kremkau disclose increased crosslinking to increase the polymer coatings adhesion or resistance to delamination to the substrate. This does not teach or suggest irradiating the polymer layers to scission the polymer bonds, but in fact leads away from Applicants' invention by teaching the importance of increasing crosslinking in order to resist delaminating and maintain dimensional stability of the polymer layers. Kremkau fail to disclose scissioning of polymer bonds, embrittlement of the polymer layer or processing conditions that would necessarily lead to scissioning or embrittlement of the polymer. Therefore, since Kremkau does not scission polymer bonds and teaches away from the energy levels and exposure times required to scission

USSN 10/721,484
Filed November 25, 2003

the crosslinked bonds of the polymer, Kremkau fails to teach or suggest each and every limitation of Applicants' method, as recited in Claims 1, 16 and 19.

Referring to the Examiner's allegation that Column 1, lines 6-9, and Column 3, lines 11-13, of the Kremkau reference allegedly disclose treating a crosslinked polymer with an additional radiation dosage of 2-20 Megarads, Applicants submit that a proper interpretation of these portions is that the addition radiation is to a dosage of 2-10 Megarads. The reference to 2-20 megarads is to the initial radiation treatment to crosslink the polymer and not the additional radiation treatment.

Specifically, referring to the portion starting at Column 1, line 60, and concluding in Column 2, line 5, Kremkau disclose a method of forming a laminate consisting of:

- (1) providing a cross-linkable substrate;
- (2) irradiating the substrate to a dosage in the range between 2 and 20 MR;
- (3) applying a layer of relatively gas impermeable material to one side of said substrate;
- (4) applying a cross-linkable layer to said impermeable layer thereby forming a laminate having layers of a cross-linked substrate, unirradiated impermeable material, and unirradiated cross-linkable material;
- (5) stretching said laminate thereby thinning same to a predetermined film thickness; and,
- (6) irradiating said laminate to a dosage level in the range of 2 to 10 MR.

Kremkau clearly disclose that the final irradiating step is at between 2 to 10 megarads, and not 2 to 20 megarads as alleged by the Examiner. Applicants further note that the examples section of the Kremkau reference only lists tests conducted with 2.5, 5,

USSN 10/721,484
Filed November 25, 2003

7.5 and 10 Megarads. Each of these tests increased crosslinking, but did not result in scissioning of the polymer chains, as taught by the Applicants.

Applicants further note that simply irradiating the laminate with a dosage between 2-20 megarads is not sufficient by itself to necessarily result in scissioning of the bonds. As recited in Claims 9, 10 and new Claim 19, in addition to irradiating the coating with an electron beam the exposure time must be sufficient to scission the polymer bonds and embrittle the coating. Kremkau do not teach the proper level or irradiation or that the exposure time be sufficient to scission the polymer bonds.

Contrary, to the Applicants' disclosure, wherein Applicants are scissioning polymer bonds to embrittle the polymer coating, Kremkau lead away from Applicants' claimed method by teaching that increased crosslinking advantageously results in increased adhesion. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore and Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983). Therefore, since Kremkau disclose treatments to increase crosslinking, Kremkau would not continue irradiation to exposure levels that would result in scission of the polymer bonds. Further, it is improper to modify references where the references teach away from their modification. *In re Graselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

In sum, Kremkau fail to necessarily teach or suggest scissioning polymer chains in the polymer by irradiating the coating with an electron beam, thereby to improve

USSN 10/721,484
Filed November 25, 2003

resistance of said coating to feathering and angel hair formation, as recited in Claims 1, 16 and 19. Therefore, since the combination of Kremkau and Hitchcock et al. fail to teach or suggest each and every limitation of Applicants' claimed method, Applicants respectfully submit that the present §103 rejection has been obviated. Applicants respectfully request that the §103 rejections of Claims 1, 2, 4-6 and 8-15, under 35 U.S.C. §103(a) be withdrawn.

Claims 1, 4-10, and 16, stand rejected under 35 U.S.C. §103(a), as allegedly being unpatentable Ohtusuki et al. in view of Kremkau. Referring to Page 4 of the present Office Action, the Examiner admits that Ohtusuki et al. fail to teach or suggest "using electron beam irradiation to scission the polymer chains to improve resistance to feathering and angel hair formation", as recited in Claims 1, 16 and 19. Kremkau fail to fulfill the deficiencies in Ohtusuki et al. for the same reasons Kremkau fail to fulfill the deficiencies in Hitchcock et al. The above comments regarding Kremkau are incorporate herein by reference. To reiterate, Kremkau fail to teach or suggest scissioning polymer chains. Therefore, since the combination of Ohtusuki et al. and Kremkau fail to teach or suggest each and every limitation recited in Claims 1, 16 and 19, Applicants submit that the present §103 rejection has been obviated and respectfully request withdrawal thereof.

Claims 1-10, and 16, stand rejected under 35 U.S.C. §103(a), as allegedly being unpatentable over Heyes et al. in view of Kremkau. Referring to Page 6 of the present Office Action, the Examiner admits that Heyes et al. fails to teach or suggest "using electron beam irradiation to scission the polymer chains to improve resistance to

USSN 10/721,484
Filed November 25, 2003

fcathering and angel hair formation", as recited in Claims 1, 16 and 19. Kremkau fail to fulfill the deficiencies in Heyes et al. for the same reasons Kremkau fail to fulfill the deficiencies in Hitchcock et al and/or Ohstusuki et al. The above comments regarding Kremkau are incorporate herein by reference. To reiterate Kremkau fail to teach or suggest scissioning polymer chains. Therefore, since the combination of Heyes et al. and Kremkau fail to teach or suggest each and every limitation recited in Claims 1, 16 and 19, applicants submit that the present §103 rejection has been obviated and respectfully request withdrawal thereof.

The §103 rejection also fails because there is no motivation in the prior art references themselves which suggests modifying the disclosed methods to arrive at the applicant's claimed method. The law requires that the prior art reference provide some teaching, suggestion or motivation to make the modification. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification."

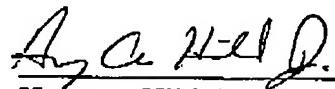
In re Fitch, 972 F.2d 1260, 1266 23 U.S.P.Q. F.2d 1780, 1783-84 (Fed. Cir. 1992).

USSN 10/721,484
Filed November 25, 2003

Accordingly, the Examiner is respectfully requested to reconsider the application, withdraw the rejections and issue an immediate favorable action thereon. If upon review of the application, the Examiner is unable issue an immediate Notice of Allowance, the Examiner is respectfully requested to telephone the undersigned attorney with a view towards resolving any outstanding issues.

An early and favorable action is earnestly solicited.

Respectfully submitted,



Harry A. Hild, Jr., Esq.
Attorney for Applicants
Reg. No. 51,803
Alcoa Technical Center
Intellectual Property
100 Technical Drive
Building C
Alcoa Center, PA 15069
Tele. No. 724-337-4726